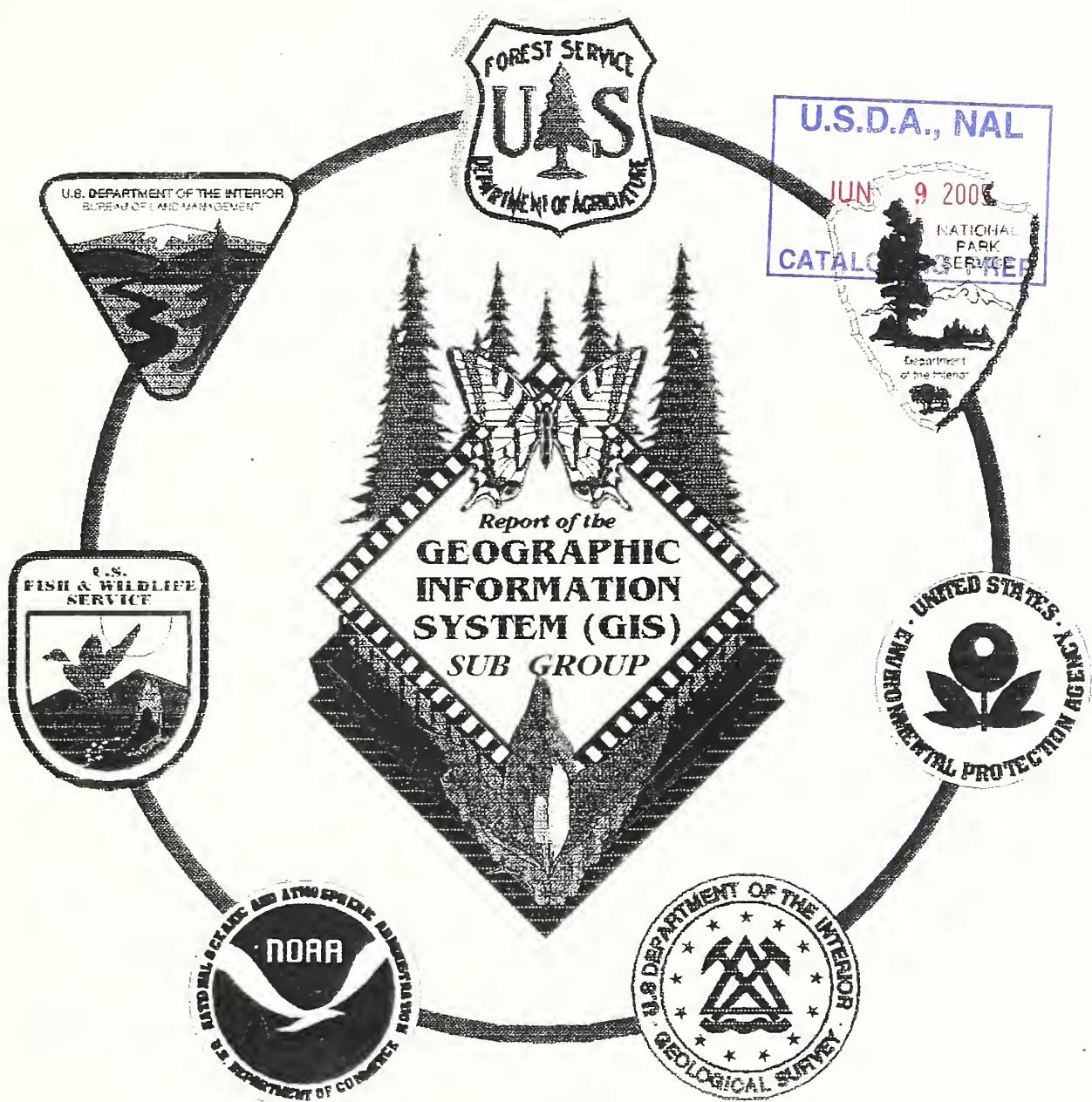


Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

Interagency Ecosystem Management

Reserve
aQH76
.I57
1993



INTERAGENCY ECOSYSTEM MANAGEMENT

Interagency Geographic Information System (GIS) Database Implementation Issue #3

October 4, 1993

Prepared By:

BLM
Phil Stanbro
Duane Dippon

NMFS
Steve Stone

EPA
Ben Eusebio

FWS
Barry Mulder

Forest Service
Lynn Vancil
Dan Oswald
Roger Crystal
John Steffenson
Ron Ochs

Graphics
Bob Vose

USGS
Gary Bohren



INTERAGENCY ECOSYSTEM MANAGEMENT
Interagency GIS Database

Introduction

This document was prepared in response to the Interagency Implementation Team's (IIT's) directive to "develop a strategic framework for a unified, interagency database". The members of the Interagency GIS Database Implementation Team examined technology (hardware, software), data, and infrastructure (staffing, organizational structure) issues and needs for creating such a database.

This proposal, presented to the IIT on October 4, 1993, includes the vision, goals, and specific action plans (where it was possible to attempt develop them in the time that was available), which identifies recommended activities, actions, responsibilities, and a time schedule for accomplishing the tasks.

VISION

To establish a seamless, current, consistent and accessible information network to support ecosystem management.

GOALS

- o **Encourage appropriate, coordinated, cost-effective use of the resource information.**
- o **Develop needed consistency in information standards and procedures among all federal resource and regulatory agencies.**
- o **Identify and develop mechanisms for ensuring the accuracy and quality of resource information used and created by public and private entities.**
- o **Provide public access to information, as appropriate.**
- o **Provide framework for broader agency/landowner participation in information management.**
- o **Ensure adequate protection of private and sensitive information.**
- o **Coordinate resource information gathering, storage, and use for inventory, monitoring, and research.**
- o **Coordinate application development, training, and use.**
- o **Support operational needs for inter-agency resource information analysis for ecosystem management.**
- o **Progressively improve quality of data over time and incrementally refine to appropriate scale(s).**

RECOMMENDATIONS

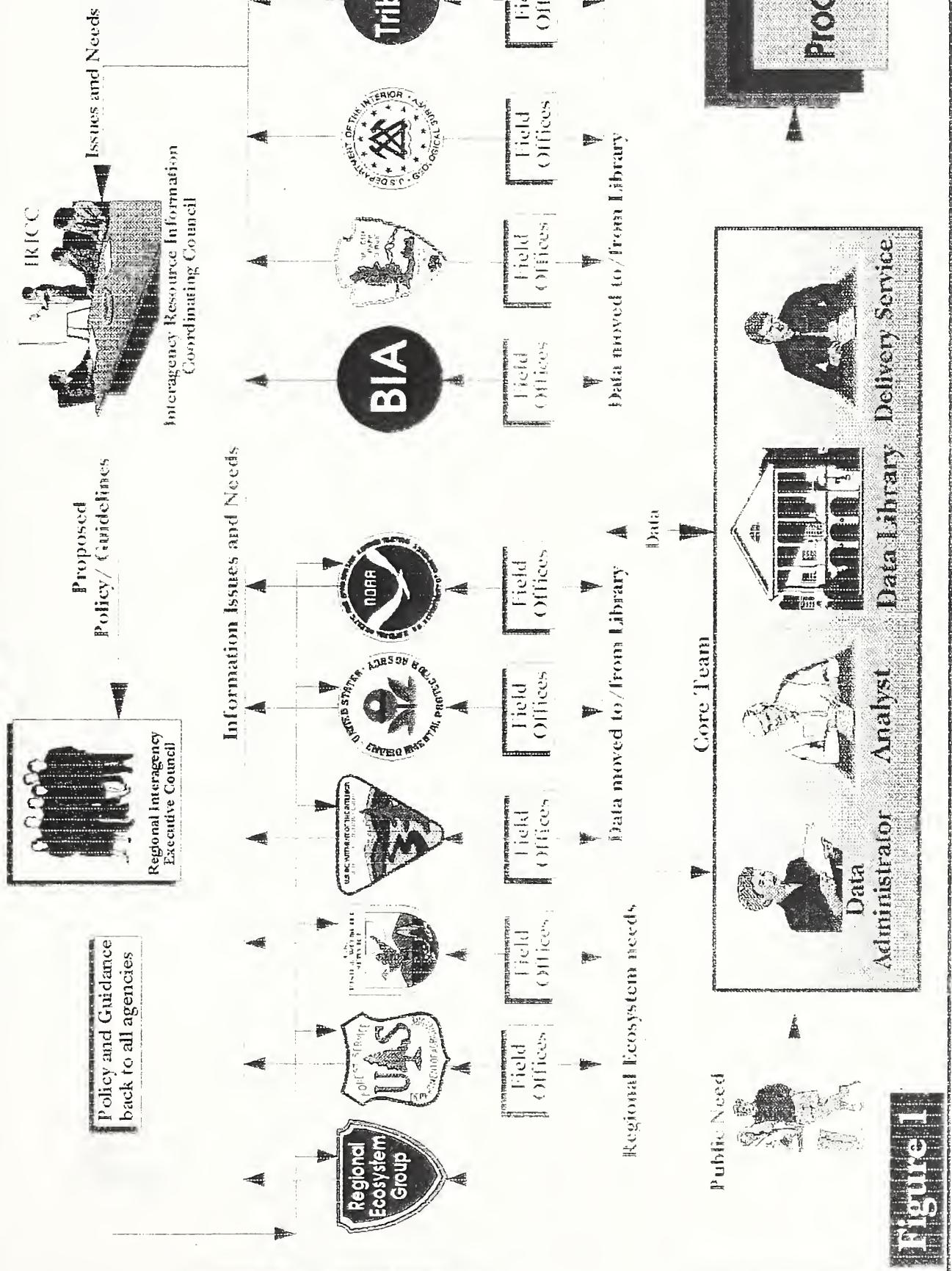
1. **Establish Interagency Resource Information Coordinating Council (IRICC).** The IRICC would have representation from participating agencies. The purpose of IRICC would be to address technical and policy issues and recommendations in the utilization of resource information, inter-governmental communications and data sharing, public access, standards, data compatibility, GIS systems, and related technologies. It will call on the advice of technical subcommittees, as required. IRICC's recommendations will be made to the Regional Inter-agency Executive Council (see Figure 1).
2. **Broaden scope of task from Interagency GIS to resource information management.** Resource information management includes all activities associated with the collection, management, and use of resource information and data; including inventories, non-spatial and spatial data, analysis methodologies, applications.
3. **Provide resource information support, maintenance and analysis services in support of Interagency ecosystem management through the establishment of a core team.**

Specific responsibilities include:

- o **Analysis:**
Meet interagency analysis needs by performing and/or coordinating analyses of a regional or sub-regional scope involving multiple agencies for issues related to an ecosystem based approach to ecosystem management.
- o **Clearinghouse:**
Indexing and catalogue information available to assist Federal, State, local, and private entities in locating existing geographic data and to provide general guidelines and assistance to those wishing to develop systems.

Corporate data, that commonly and broadly used, should be easily accessible for use by other public and private entities.
- o **Provide support for identifying interagency ecosystem management needs in information standards development.**

INTERAGENCY RESOURCE INFORMATION MANAGEMENT



INTERAGENCY RESOURCE INFORMATION MANAGEMENT

Based on Recommendations

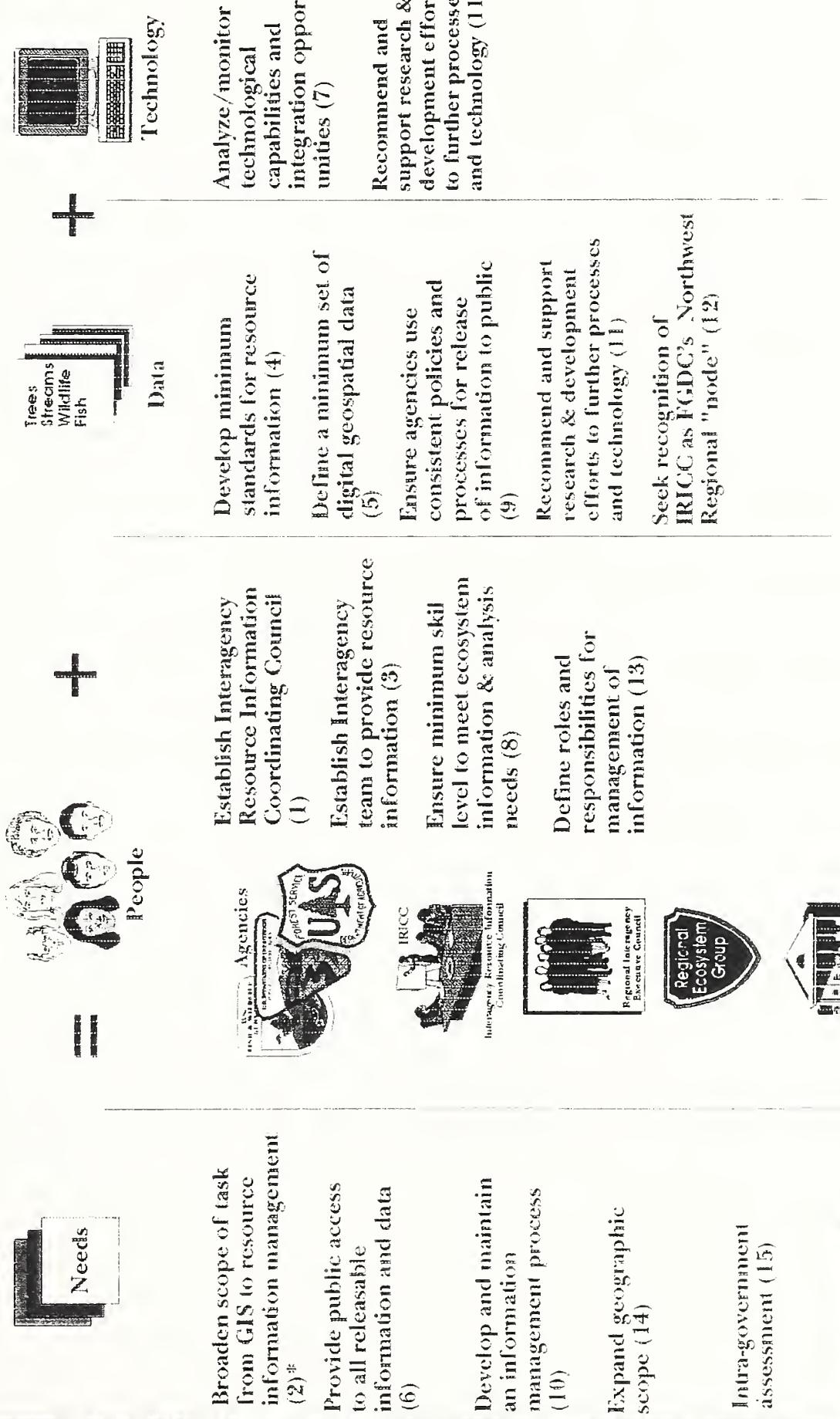


Figure 2

Core Team

* Recommendation Numbers

- o Facilitate the development and coordinate the acquisition of interagency data sets identified in the IRM planning process (recommendation #10).

4. **Develop minimum standards for resource Information.** IRICC will be responsible for coordinating the development of information/data standards for all participating agencies. Participating agencies should be willing to commit resources to assist in developing and implementing consistent standards. Standards will be developed in the following areas:

- a. **Metadata** (data about data) - Establishment of a minimum set of information about data (e.g. scale, accuracy, control points, collection dates, purpose, and methods) to be routinely required of information collectors, planners, and developers of databases and applications. An appropriate disclaimer should be required on any and all final maps and products produced.
- b. **Data accuracy** - Develop/define standards for accuracy of resource information, where appropriate.
- c. **Data attributes** - Develop minimum standards consistent and coordinated with the Federal Geographic Data Committee (FGDC). FGDC has formed subcommittees to develop standards for various "thematic" categories of data.
- d. **Geodetic control** - Should use "High-Precision Geodetic Network" as the foundation of all information products.
- e. **Data transfer** - Comply with all current Federal Info Process Standards (FIPS) and coordinate with FGDC regarding emerging standards and policies.
- f. **Transactional database updating and revision** - Identify schedule and overall methodology to revise map and attribute data. Develop process that replaces only map elements and attributes that have changed, and treat changes as stored transactions. In contrast to wholesale replacement, this approach allows for better retention of site and application specific additions and for full analysis of chain of events.

5. **Define and acquire minimum set of digital base data (framework) needed to satisfy most users.** Base data in this framework would most likely include elevation models, transportation, culture features, hydrology, boundaries, and public land survey. Consistent with established standards, the framework should be standardized on the 1:24,000 base map. Thematic (resource) data may be captured at various resolutions, however, it must be registered to the framework (see recommendation #10 for detailed action item for thematic data).

6. **Provide public access to all releasable information and data.** The focus will be to provide the public and any other interested entity access to all releasable information that is currently available. Development of new data and/or products would require an agreement between the executive group and requesting party.
7. **Analyze/monitor technological capabilities and integration opportunities.** Examine opportunities to integrate technologies where possible and necessary among participating agencies.
8. **Ensure minimum level of skills are available to meet ecosystem information and analysis needs.**
9. **Ensure agencies use consistent policies and processes in the release and dissemination of information to the public.**
10. **Develop and maintain an information management process that coordinates ecosystem management's information needs and formulates cost effective plans to accomplish required actions.**
11. **Recommend and support research/development efforts to further the methodology and technology used in resource information gathering and analysis.**
12. **Seek recognition of IRICC as FGDC's Northwest Regional "node".**
13. **Clearly define roles and responsibilities as they relate to the acquisition and management of information.**
14. **Define and develop an information management process that focuses initially on the original geographic extent of the FEMAT (range of the northern spotted owl) but recognizes that the logical extent an Interagency ecosystem database is broadly defined by including the major river basins which flow from the Continental Divide, west to the Pacific Coast through the range of the northern spotted owl.**
15. **Coordinate efforts and integrate when possible with other governmental agencies.**

ACTION PLAN
(10/04/93)

1. Establish Interagency Resource Information Coordinating Council (IRICC).

Background/Rationale: We believe it is imperative that we create an integrated and coordinated approach to managing information that not only is responsive to the needs related to an interagency approach to ecosystem management, but is consistent and supportive of the overall missions and goals of each of the participating agencies. To the extent possible, we need to create and maintain consistent data across and within participating agencies. The proposed council should enable participating agencies to have adequate ownership and involvement in the formulation of policies and proactives needed to achieve our stated goals.

Actions: A. Identify 1 representative from each participating agency

When: November 1, 1993

Who: Regional Executives - Nominate
 Regional Interagency Executive Council (RIEC)- Approve

B. Finalize charter and operating guidelines

When: November 15, 1993

Who: IRICC - Recommends
 RIEC - Approve
 Interagency GIS Group - Provide draft to IRICC by Nov 1, 1993

Estimated Impact
to IRICC: First year = 30 days
 After Year 1 = 12 days/year

2. Broaden scope of task from Interagency GIS to resource Information management.

Background/Rationale: The concept of "GIS" often carries misleading perceptions regarding the scope and magnitude. It also refers to a technology which has served to highlight information management issues but is not, in and of itself, the issue. We feel the participating agencies need to coordinate and integrate efforts, where practical, in the overall area of resource information; including but not limited to data consistency, data collection, and data use. While efforts need to effectively support ecosystem management, differentiating and limiting

information management efforts to those solely and directly associated with ecosystem management would be extremely difficult and inefficient.

Action: Decision

When: October 4, 1993

Who: Regional Executive Interagency Committee

3. Provide resource information support, maintenance and analytical support for implementation of an interagency approach to ecosystem management.

Background/Rationale: There are two distinct aspects of resource information; management and technical assistance. While the proposed interagency council would be responsible for formulating and managing the management issues (policies, guidance, issues, etc.), there must be capability to meet the technical needs of any interagency committees and/or respond to public requests for information. Ownership and involvement is again a paramount concern/issue with this recommendation. How do we effectively meet the technical needs and at the same time keep players informed and involved?

Alternatives/Options:

Extent of Role/Responsibility:

1. Index/catalog: description of available data and location.
2. Data/spatial analysis.
3. Data library: set of core data.
4. Management of core data set: processing, storage, release to requestors, etc.
5. Information management (standards, acquisition, etc.).

Organization Approach:

1. Ad-hoc technical groups: no permanent organization established. Respond to needs on an ad-hoc basis.
2. Permanent technical assistance: establishment of a permanent organization to meet needs.
3. External/contract services: utilization of external entities/contractors.
4. Oregon/Washington State Service Centers: utilization of existing state available capabilities.
5. Combination of above.

Recommendations:

A. Approach:

1. Establish permanent interagency core team to support data administration and analysis functions. Establish staffing at the minimum level necessary to ensure *continuity and consistency* (see Figure 4).

When: November 1, 1993 or ASAP

What: (see Figure 5) We recognize the need for 4 primary skill requirements needed to provide continuity and consistency; administration, analysis, database management, and system management. Since each of these skills are unique, we recommend the establishment of a core team of 4 specialists to support the West-side effort.

Who: IIT

Costs:

Permanent Staff: Approx \$200,000 per year

Technology: Initial investment of approx \$400,000 with an annual maintenance and upgrade cost of \$50,000.

Office Space and Management: To be estimated in the overall Ecosystem Group report.

Total Costs: 1st year - \$600,000; recurring \$250,000.

Note #1: This is based on our best guess at this point given the knowledge we have of the magnitude of the project. The estimate will be fine-tuned, following the completion of Recommendation 10 (development and maintenance of a comprehensive Information Management Plan).

Note #2: This proposal assumes that each agency will maintain expertise at their respective sites to support agency data and analysis needs. These positions may need to be new positions rather than staff reassignments from existing agencies.

Note #3: If the scope of the project increases to incorporate the eastside (see recommendation 14), an additional administrator/analysis staffing would be necessary to respond to the unique needs of the eastside.

INTERAGENCY RESOURCE INFORMATION MANAGEMENT

Workload / Staffing

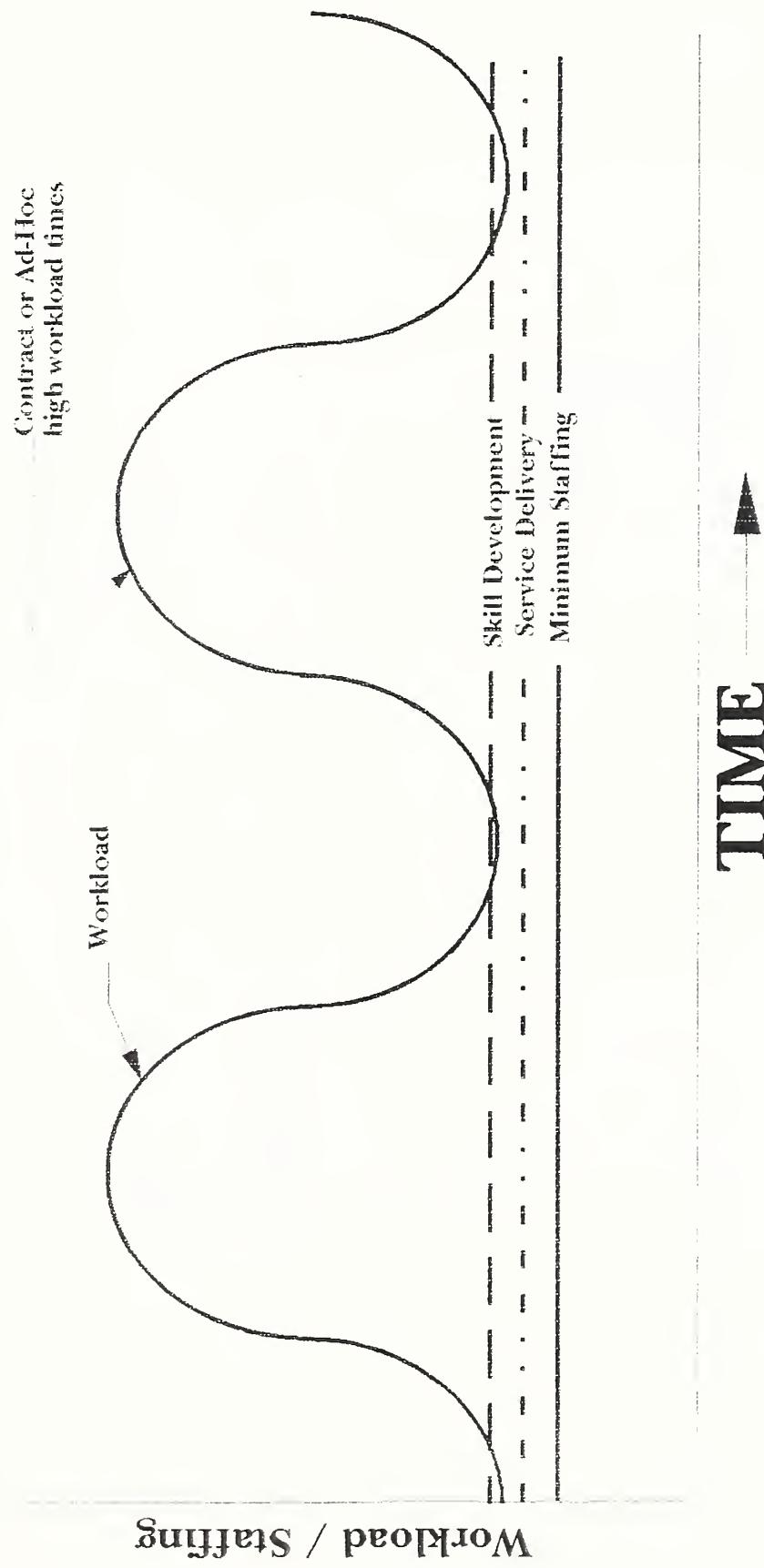


Figure 4

INTERAGENCY RESOURCE INFORMATION MANAGEMENT

Core Team

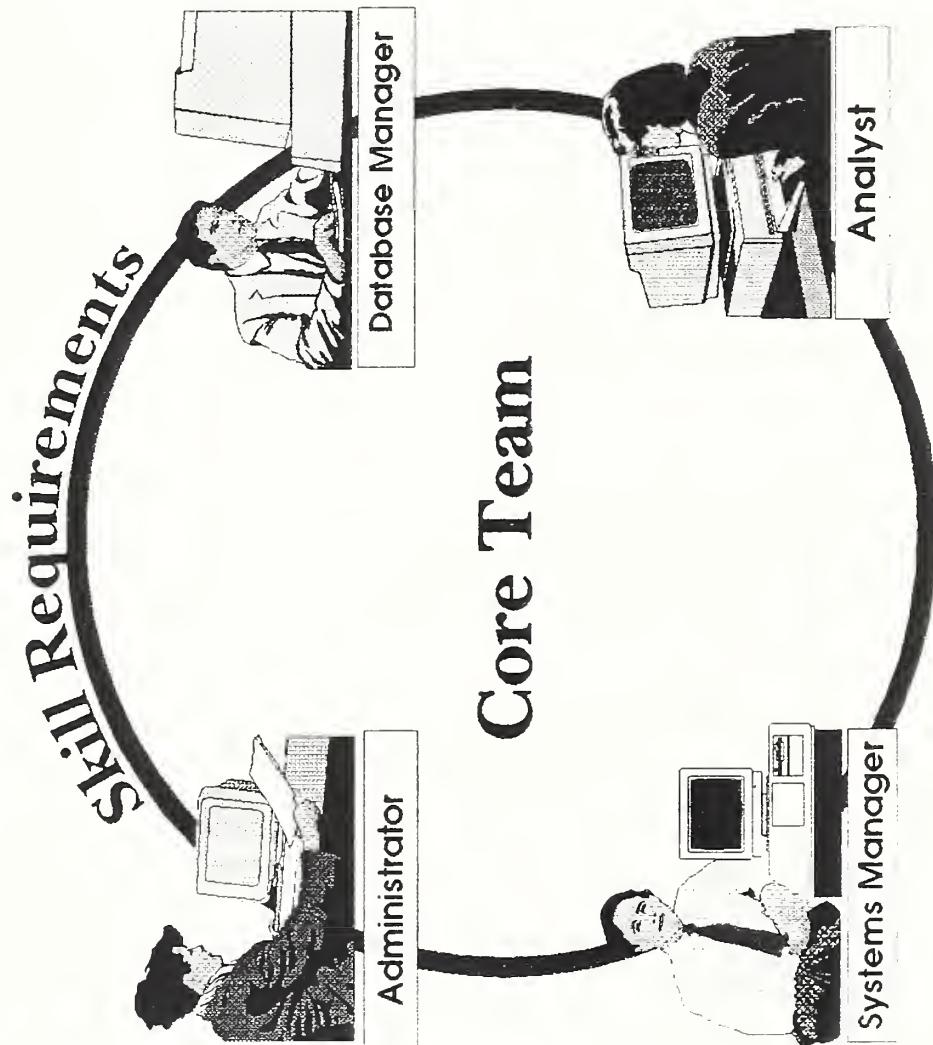


Figure 5

2. Determine approach for managing and delivering of information (i.e. maintaining library/index, providing information to public, etc). In order to increase operational flexibility and promote increased public service, we believe it is necessary to examine the feasibility of external/contractual arrangements to respond to this need.

What: Finalize approach and implement

When: February 15, 1994

Who: IRICC/Core Team

Costs for:

Service Delivery; depends on amount of demand but estimate approx. \$100,000 per year.

3. Respond to heavy GIS analysis needs by using ad-hoc and/or contract approach. Recommend the establishment of an operating plan approved by participating agencies to support peak demands.

When: January 15, 1994

Who: IRICC/Core team

4. Establish process to periodically measure accomplishments and identify issues relative to staffing and funding.

When: March 15, 1994

Who: IRICC/Core team/Regional Eco-system Group

5. Utilize interagency environment as a development/training opportunity for field personnel. Establish a permanent training/development process for participating agencies to expose employees to Regional-level ecosystem analysis. Estimate 1-2 people on 1-2 month detail on a regular basis. Participating agencies would absorb all salary and travel costs since it is considered employee development.

When: March 15, 1994

Who: IRICC/Core team

B. Responsibilities:

Database maintenance and support
Database updating
Documentation
Clearinghouse function and oversight
Technical support of IRIICC
Analysis needs of SAG
Analysis needs of Ecosystems Staff (e.g., regional/provincial analysis)
Other programmatic analytical needs (e.g., programmatic consultation)
Development/coordination of interagency datasets
Interagency coordination for ecosystem projects
Resolution of data conflicts (i.e., common boundary between two administrative units doesn't match).

4. Develop minimum standards for resource information.

Background/rationale: Consistency and compatibility of data requires the establishment and utilization of data/process standards among all participating agencies. The list below (a-f) represents those elements of standards we feel are critical to ensure success.

a. Metadata

Alternatives:

1. Expand existing metadata
2. DNR/Oregon State
3. Other

Recommendation(s):

1. Follow FGDC-suggested minimum requirements. Use SPUD (existing metadata created for FEMAT) as the starting point.
2. Identify any additional needs via IRM planning process (recommendation 10).

Action:

Establish metadata standards and system

When: February 15, 1994

Who: IRIICC

- b. Data accuracy
- c. Data attributes
- d. Geodetic control
- e. Data transfer
- f. Transactional database updating and revision

Actions: A. Incorporate data standards commitment into MOU with participating agencies whereby each agency is committed to the establishment and implementation of a minimum set of standards and data sharing necessary to support ecosystem management.

When: December 15, 1993

Who: IIT/RIEC

B. Complete *preliminary* set of data standards items b-f above

When: March 15, 1994

Who: IRICC

5. **Define and acquire minimum set of digital spatial data (framework) needed to satisfy most users.**

Background/rationale: A minimum set of basic data is needed by all agencies for a variety of purposes; this is also true in an interagency setting. The USGS provides much of this data as part of the 7 1/2 minute mapping program in the form of DLG files.

Actions: A. Accept basic data defined and provided by USGS as the minimum set: elevation, transportation, cultural features, hydrology, boundaries, and public land survey.

When: October 19, 1993

Who: IIT/RIEC

B. Define magnitude and strategy to get basic layers developed for all participating agencies. Tie into the NWLIS effort. The NWLIS is currently tasked to identify the need in this area and present to the agency executives in November for action. Recommend the establishment of a formal agreement with NWLIS to complete this task by the dates outlined below.

When: November 18, 1993

Who: IRICC establish agreement; NWLIS complete.

Costs: Estimates being prepared by NWLIS.

6. Provide public access to all releasable information and data.

Background/Rationale: Due to public interest, we need to be responsive to public requests by disseminating information and data identified as non-proprietary by participating agencies.

Action: Establish central library of resource information

When: August 1994

Who: IRICC - staff; Executives - decision

7. Analyze/monitor technological capabilities and integration opportunities.

Background/Rationale: While each agency needs to acquire technology necessary to respond to their specific goals and objectives, we feel opportunities are available to coordinate, consolidate, and integrate technologies that could benefit all participants.

Action: Establish process whereby each agency coordinates, communicates technological plans and strategies, and integrates where applicable.

When: January 30, 1994

Who: IRICC

8. Ensure minimum level of skills are available to meet ecosystem information and analysis needs.

Background/Rationale: Maintaining adequate skills among all the participating agencies is critical in order to ensure consistent analyses and to provide adequate staffing to respond to peak demands.

Action: Formulate plan to ensure adequate skills are available and constantly developed to respond to existing and emerging demands.

1. Assess current capability
2. Define minimum levels
3. Provide skill development opportunities (see recommendation #3)

When: March 1994

Who: IRICC

9. Ensure participating agencies use consistent policies and processes in the release and dissemination of information to the public.

Background/Rationale: We feel it is critical that all participating agencies adopt a consistent approach to release of data and information.

Actions: Develop interagency policy and guidelines for release of information to the public.

When: May 1994

Who: IRICC - develop
RIEC - approve

10. Develop and maintain an information management process that coordinates ecosystem management information needs and formulates cost effective plans to accomplish required actions.

Background/Rationale: Reacting to information/data requests not only costs considerably more in the long-run, it causes substantial data accuracy and integrity issues. In order to be proactive, we need to fully understand the objectives and needs of all the groups and develop a comprehensive information management plan that allows us to effectively and efficiently collect, manage, and use information/data.

Actions: A. Define information management process
 Include description of objectives, roles, responsibilities, process, estimated impact, participants, timeframes, maintenance, etc.

When: November 15, 1993

Who: Interagency GIS group - develop
 Regional Executive Committee - approve
 Interagency Implementation Teams

B. Complete IRM plan
 Include description of information needs, acquisition, database, application development priorities, staffing/skill requirements, costs, timeframes, etc.

When: January 15, 1994

Who: IRIICC - develop
 Regional Executive Committee - approve

C. Approve budget requirements necessary to complete tasks A&B

When: October 4, 1993

Who: IIT

Costs: Consultant needed to facilitate actions A&B - estimated cost = \$10,000.

11. Recommend and support research/development efforts to further the methodology and technology used in resource information gathering, and decision support.

Background/Rationale: Numerous opportunities exist to improve the flow of information and cost efficiency of collecting data. A coordinated effort to first identify these opportunities is needed.

Action: Identify knowledge/technology gaps in resource information gathering methodology and develop a strategy to meet needs through research and technology development approaches. Develop a coordinated plan to support needed research/development efforts (tie into recommendation 10b).

When: June 1994

Who: Research Working Group and IRIICC

12. Seek recognition of IRIICC as FGDC's Northwest Regional "node".

Background/Rationale: The FEMAT report identified the need to integrate any efforts to establish interagency information processes with activities of the Federal Geographic Data Committee (FGDC).

Action: Submit a letter requesting recognition by FGDC at the Northwest Regional Node and include a copy of the Strategic Plan.

When: November 1, 1993

Who: IRIICC

13. Clearly define roles and responsibilities as they relate to the acquisition and management of information resources.

Background/Rationale: Understanding roles and responsibilities is a key item required to ensure success.

Action: Roles and responsibilities clearly defined and adopted by all participating agencies.

When: Preliminary list completed by December 15, 1993

Who: IRICC - develop
RIEC - approve/adopt

Costs:

14. Define and develop an information management process that focuses initially on the original geographic extent of the FEMAT (range of the northern spotted owl) but recognizes that the logical extent of an interagency ecosystem database is broadly defined by including the major river basins which flow from the Continental Divide, west to the Pacific Coast through the range of the northern spotted owl.

Background/Rationale: The core member federal agencies charged with implementing the President's Option, have management authority extending to the east of the range of the northern spotted owl. While the FEMAT was able to justify its focus on this limited area, the importance of the entire river basins on the health of anadromous fish populations brings the recognition of a broader perspective. This action will unify the agencies to the broader recognition of their responsibilities, both administratively and with a more holistic view of the ecosystem for which they are accountable.

Action: Expand geographic scope. Recognize that the Eastern boundary extends to the major river basins between the FEMAT focus area and the Continental Divide.

When: November 1, 1993

Who: IIT/RIEC

15. Coordinate efforts and integrate when possible with other governmental agencies.

Action: Complete assessment of other information management efforts and identify integration and coordination opportunities. At a minimum, coordinate efforts with:

BPA	Northwest Environmental Database (NED) Coordinated Information System (CIS)
USFWS	National Wetlands Inventory GAP Analysis Program
Private	Natural Heritage
States	Oregon GIS Service Center, Washington DNR
NBS	National Biological Survey
SCS	National Cooperative Soil Survey

When: Preliminary assessment and system to stay abreast of actions completed by January 1, 1994

Who: IRICC

INTERAGENCY RESOURCE INFORMATION MANAGEMENT

		Timeline								
Group	Responsible	Oct 1993	Nov	Dec	Jan 1994	Feb	Mar	Apr	May	Jun
IIT		Broaden scope from GIS to Resource Information Management								
IIT	RIEC	Oct 4 (2A)								
IIT		Approve budget requirements necessary to complete tasks 10a & 10b								
IIT		Oct 4 (10C)								
RIEC		Appoint IRICC Members								
IIT		Nov 1 (1A)								
IIT		Establish Permanent Core team								
IIT		Nov 1 (3A1)								
IIT		Accept basic data defined and provided by USGS as minimum set								
IIT/RIEC		Nov 1 (5A)								
RIEC		Expand geographic scope								
RIEC		Nov 1 (14)								
RIEC		Submit letter requesting recognition by FGDC								
RIEC		Nov 1 (12)								
RIEC		Establish IRICC charter and guidelines								
RIEC		Nov 15 (1B)								
RIEC		Define information management process								
RIEC		Nov 15 (10A)								
IIT		Define magnitude and strategy to get basic layers developed for agencies by NWIIS								
RIEC		Nov 18 (5B)								
IIT		Incorporate data sharing/standards commitment into MOU with agencies								
RIEC		Dec 15 (4b-f, A)								
IIT		Roles and responsibilities defined and adopted by agencies								
RIEC		Dec 15 (13)								

IIT = Interagency Implementation Team

RIEC = Regional Interagency Executive Council

IRICC = Interagency Resource Information Coordinating Council

Figure 3a

INTERAGENCY RESOURCE INFORMATION MANAGEMENT

Timeline

Group Responsible	Oct 1993	Nov	Dec	Jan 1994	Feb	Mar	Apr	May	Jun
IRICC					Intra-government assessment	Jan 15 (15)			
CORE					Establish operating plan for peak demands	Jan 15 (3A3)			
IRICC/Tech committees					Complete IRM Plan	Jan 15 (10B)			
IRICC					Establish process for each agency to coordinate tech plan and strategies	Jan 30 (7)			
IRICC					Examine opportunities for the service & delivery of information	Feb 15 (3A2, 6B)			
IRICC					Establish metadata standards and system	Feb 15 (4a)			

Figure 3b

IIT = Interagency Implementation Team

RIEC = Regional Interagency Executive Council

IRICC = Interagency Resource Information Coordinating Council

INTERAGENCY RESOURCE INFORMATION MANAGEMENT

Group Responsible	Feb 1994	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Timeline	
CORE											Monitoring / Accountability Core team	
CORE											Mar 15 (3A4)	
CORE											Establish interagency training/development opportunities for agencies employees in ecosystem analysis	
IRICC											Mar 15 (3A5)	
IRICC											Complete Preliminary set of data standards items	
IRICC											Mar 15 (4b-f, A)	
IRICC											Formulate plan to ensure adequate skills	
IRICC											Mar 15 (8)	
IRICC											Develop interagency policy and guidelines for release of information to public	
IRICC											May (9)	
IRICC											Identify information requirements common to agencies specific to ecosystem mtgs	
IRICC											Jun (11A)	
IRICC											Identify knowledge / Technology gaps in resource information gathering	
IRICC											Jun (11B)	
IRICC											Establish central library of resource information	
IRICC											Aug (6A)	

IIT = Interagency Implementation Team
 RIEC = Regional Interagency Executive Council
 IRICC = Interagency Resource Information Coordinating Council

Figure 3c

ACRONYMS

FEMAT	Forest Ecosystem Management Assessments Team
FGDC	Federal Geographic Data Committee
FIPS	Federal Information Processing Standards
GIS	Geographic Information System
IIT	Interagency Implementation Team
IRICC	Interagency Resource Information Coordinating Council
IRM	Information Resource Management
MOU	Memorandum Of Understanding
NWLIS	Northwest Land Information System Network
RIEC	Regional Interagency Executive Council
SAG	Scientific Advisory Group
SPUD	Spatially Unified Database

